AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims of the application:

LISTING OF CLAIMS:

Claims 1 to 32. (Cancelled).

33. (New). A method for non-destructive testing of an element for a nuclear reactor, comprising:

acquiring a radiographic digital image of at least one area in the element;

creating a reference image through digital processing of the radiographic image obtained; and

comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference image to detect a presence of defects.

34. (New) The method according to claim 33, wherein the element is part of a nuclear fuel assembly.

35. (New) The method according to claim 34, wherein the element is a nuclear fuel rod extending along a longitudinal axis and comprising a sheath sealed by top and bottom plugs and containing a nuclear fuel.

36. (New) The method according to claim 35, wherein the area comprises a weld bead between one of the plugs and the sheath.

37. (New) The method according to claim 35, wherein the area comprises a spot weld sealing off a channel passing through the plug.

38. (New) The method according to claim 33, wherein the step of creating a reference image through digital processing of the radiographic image obtained

comprises a substep of one of opening and closing the image by adding a structuring element.

39. (New) The method according to claim 38, wherein the structuring element has a shape that is elongated along the longitudinal axis of the rod.

40. (New) The method according to claim 39, wherein the structuring element is a segment of p pixels, wherein p is a whole number that is not zero.

41. (New) The method according to claim 39, wherein a defect that has to be detected is one of porosity and lack of penetration of the weld bead and in that the substep is opening the image by adding the structuring element.

42. (New) The method according to claim 39, wherein a defect that has to be detected is a tungsten inclusion and that the subset is closing the image by addition of the structuring element.

43. (New) The method according to claim 38, wherein the step of creating a reference image through digital processing of the radiographic image obtained has a substep of smoothing the image through a convolver prior to the step of one of opening and closing the image by adding a structuring element.

44. (New) The method according to claim 43, wherein the convolver is a square of n adjacent pixels, wherein n is a whole number that is not zero.

45. (New) The method according to claim 33, wherein the step of comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference image to detect a presence of defects comprises a substep of calculating a difference between the acquired image that is one of processed and unprocessed, and the reference image and of dividing the difference by one of the radiographic image obtained, that is one of processed and unprocessed, and the reference image.

46. (New) The method according to claim 45, wherein after the substep, the image is multiplied by a coefficient substantially corresponding to a maximum light intensity of a viewing device used to obtain the radiographic image.

47. (New) The method according to claim 45, wherein after the substep, the image is smoothed using a convolver.

48. (New) The method according to claim 47,wherein the convolver is a square of q adjacent pixels, wherein q is a whole number.

49. (New) The method according to claim 47, wherein the convolver lies transversely with respect to a longitudinal axis extending along the element.

50. (New) The method according to claim 45, further comprising: binarization of the image after the substep of calculating a difference between the acquired image that is one of processed and unprocessed, and the reference image and of dividing the difference by one of the radiographic image obtained, that is one of processed and unprocessed, and the reference image.

51. (New) The method according to claim 37, wherein the step of creating a reference image through digital processing of the radiographic image obtained comprises a substep of projecting the image along the longitudinal axis and reconstructing the image from projection along the axis.

52. (New) The method according to claim 51, further comprising: smoothing the image acquired by the convolver prior to the substep of projecting the image along the longitudinal axis and reconstructing the image from projection along the axis.

53. (New) The method according to claim 52, wherein the convolver is a square of t adjacent pixels, wherein t is a whole number.

54. (New) The method according to claim 51, wherein comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference image to detect a presence of defects comprises a substep of subtracting the reference image from the image obtained.

55. (New) The method according to claim 54, further comprising: binarization of the image after the substep of subtracting the reference image from the image obtained.

56. (New) The method according to claim 33, further comprising: automatically detecting and determining characteristics of a region of the image produced in comparing the radiographic digital image obtained, one of processed and unprocessed, with the reference image to detect a presence of defects corresponding to a defect.

57. (New) The method according to claim 56, wherein one of the characteristics is a position of the defect detected in the image.

58. (New) The method according to claim 56, wherein one of the characteristic is representative of a dimension of the defect.

59. (New) The method according to claim 51 further comprising: determining a minimal axial thickness of the spot weld.

60. (New) The method according to claim 56, wherein the method is performed for more than one viewing angles.

61. (New) The method according to claim 60, further comprising: reconstructing defects detected in the images corresponding to the more than one viewing angles.

62. (New) The method according to claim 61, wherein the step of reconstructing defects detected in the images corresponding to the more than one viewing angles comprises a first substep of determining positions which a

defect detected in a first image corresponding to a first viewing angle occupies in a second image corresponding to a second viewing angle, a second substep of comparing positions so determined with the positions of the defect actually detected in the second image to determine whether the defect has been detected in the second image, and upon detection of the defect in the second image, performing a third substep of calculating a dimension of the defect from representative characteristics of the dimensions of the defect determined in the first and second images.

63. (New) The method according to claim 58, further comprising: summing representative characteristics of the dimension determined for more than one viewing angles and comparing the sum with a threshold value in order to obtain a decision on whether the element conforms with predetermined manufacturing criteria.

64. (New) The method according to claim 59, further comprising: calculating a mean of a minimum thickness determined from several viewing angles and comparing this thickness with a threshold value to make a decision on whether the element conforms with predetermined manufacturing criteria.